REMARKS

Telephone Interview Summary

Applicant thanks the Examiner for taking the time to discuss the Final Office Action with their representative in Canada (Daphne L Maravei – Reg. #53,881) and inventor Dave Maenz in a telephone interview on December 8, 2009. In the telephone interview, Examples 22 and 25 of cited reference Sirén 1 were discussed with the Examiner. The applicant pointed out that these Examples either alone or together did not teach or suggest the elements of Claim 1 of the present invention. The starting material of Example 25 is a purified phytate and thus does not contain the neutral sugars that are contained in the slurry of plant material in the starting material of Applicant's invention. The neutral sugars are intrinsic to the plant material that is used as a starting material in the present invention. As such, the applicant's representative explained that step (a) of claim 1 is not taught, nor are steps (c) (the separation of the neutral sugars from the charged first ionic fraction) and (e) (the isolation of neutral inositol). The applicant's representative further explained that Example 22 of Sirén 1 does not teach the elements of claim 1 steps (c), (d) and step (e). An amendment to claim 1 to recite the neutral sugars in the slurry of plant material was discussed and it was agreed that the amendment would certainly form a basis for distinguishing the present application from Sirén 1. Applicant's representative also explained that Sirén 2 did not overcome the deficiencies of Sirén 1 in teaching the Applicant's invention. Furthermore, the applicant's representative explained that Vanderbeke merely disclosed an optimized enzyme mixture that would be useful in full hydrolysis, however this reference did not disclose the invention in claim 1 nor did it make up for the deficiencies of Sirén 1 and Sirén 2.

Amendments to the claims

The applicant has amended claim 1 in order to clarify that in step (a), the aqueous slurry of plant material contains a mixture of neutral sugars. Furthermore, step (c) of claim 1 has been clarified to show that the mixture of neutral sugars are separated along with

the neutral fractions in step (c).

Support for the amendment can be found at paragraphs [0004] and [0008] of the published application (which is identical to the application as originally filed).

Claim 1 has been amended to further clarify the invention and no new matter has been added by way of the amendments to the claim.

35 U.S.C.§103

The objective of the Applicant's invention is to isolate inositol from plant material. Separating inositol from plant material is difficult since inositol is a neutral soluble sugar that is very similar in molecular size and charge characteristics to other sugars such as glucose, fructose and sucrose that are present at a high concentration in a slurry of plant materials. The core of the invention is to utilize a method for the partial hydrolysis of the phytate in the plant material to charge inositol phosphate intermediates, separate these intermediates from the neutral sugars in solution, and then complete the full hydrolysis of the intermediates, and then separate the neutral inositol from charged ions and compounds.

Claims 1-20 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Sirén (US 4, 734, 283 – hereinafter Sirén 1), Sirén (US 4,797,390 – hereinafter Sirén 2) and Vanderbeke et al (US 5,554,399).

At pages 2, 3 and 7 of her Report, the Examiner cites Sirén 1 against the present invention on the basis of Examples 22 and 25. In particular, at page 7 the Examiner has reviewed Example 25 in detail and indicates that Sirén 1 teaches separating the slurry into a water soluble fraction and a water insoluble fraction, hydrolyzing the inositol phosphates in the first ionic fraction in order to determine the contents of phosphorus and inositol. The Examiner also asserts that after measuring the peaks, Sirén 1 teaches separating the hydrolyzed first ionic fraction in a second ionic fraction and a

second neutral fraction which contains purified inositol. Applicant respectfully traverses the objection on the following basis:

Example 25 of Sirén 1 teaches using a starting material that is purified sodium phytate (sourced from Sigma Chemical). Given the source is purified, the starting material does not contain any of the neutral soluble sugars found in the starting material of the present invention. On the other hand, the starting material of the present invention is a slurry containing a mixture of other neutral sugars such as fructose, glucose and sucrose that are present at high concentrations in a slurry of plant material. As described above, the objective of the present invention is the isolation of inositol from a plant material that has such neutral sugars.

The purified sodium phytate in Example 25 is then partially hydrolysed with phytase. It is passed through a column and eluted with increasing concentrations of HCl in order to displace the inositol phosphates. Eluted fractions are then hydrolyzed for the purpose of identifying the various inositol phosphates. However, the mixture that is passed through the column is simply a mixture of inositol phosphates without any neutral sugars. As such, Sirén 1 is merely measuring the various forms of inositol phosphates in order to quantify them and detect IP3.

When contrasted with claim 1 of the present invention, step (a) is not taught since there is no slurry of plant material containing a mixture of neutral sugars, rather the starting material is simply purified phytate. Step (c) is not present since Example 25 does not separate the water soluble fraction into a first ionic fraction from another neutral fraction which contains neutral sugars, a very key step in the present invention. Furthermore, step (e) of claim 1 is equally not taught in Sirén 1, since the step of isolating the inositol from the other charged components is not disclosed.

Example 22 of Sirén 1 equally does not teach the present invention. In Example 22 wheat phytase is added to ground beans, and the mixture is incubated and then frozen in order to achieve partial hydrolysis. The frozen material is then extracted with HCl and

centrifuged and the supernatant is neutralized and analyzed. The IP3 content is measured. This does not teach step (c) of the present invention since there is no separation step of a first ionic fraction from the neutral fraction containing the neutral sugars. Furthermore there is no disclosure of steps 1 (d) and 1 (e) of the present invention–a full hydrolysis step of inositol phosphates or a separation of the first ionic fraction into a second ionic fraction and a second neutral fraction which contains inositol.

Sirén 2 teaches a process where the higher inositol phosphates are broken down enzymatically to IP_3 with phytase enzyme and then added to a pharmaceutical composition in an amount sufficient to reduce the negative effect of cadmium or aluminum in the body. This is a completely different objective than that of the present invention. The Examiner asserts that Sirén 2 was brought in since it teaches using the phytase enzyme that is normally present in all inositol phosphate containing plants and seeds to hydrolyze the inositol phosphates in the first ionic fraction or newly add a phytase enzyme to hydrolyze the inositol. Further, that Sirén 2 also teaches using filtration to separate the slurry into a water soluble and water insoluble fraction. Applicant acknowledges that Sirén 2 teaches adding a phytase enzyme to a mixture of higher inositol phosphates to break them down to IP_3. However, Sirén 2 does not teach the present invention, and at a minimum does not teach steps (c), (d) and (e) taught by claim 1 of the present invention that are also missing from Sirén 1. Applicant also submits that using the phytase enzyme that is normally present in all inositol phosphate containing plants is not commercially feasible.

The core of the present invention is to utilize a method for the partial hydrolysis of phytate to charge intermediates, separate these negatively charged intermediates from the neutral sugars in solution and then complete the hydrolysis to generate neutral inositol that can be readily separated from charged ions and compounds using known charged based separation techniques. The elements of claim 1 and dependent claims 2-20 are not taught or disclosed by Sirén 1 or Sirén 2 individually, nor by the combination of Sirén 1 and Sirén 2.

Vanderbeke teaches an optimized mixture to provide complete hydrolysis. Applicant acknowledged that Vanderbeke teaches an enzyme composition that comprises a phytase that displays a higher synergistic activity at a pH from 2.5 to 5.0 and an acid phosphatase having phytate hydrolyzing activity at a pH of 2.5. Nevertheless, Vanderbeke merely teaches that full hydrolysis is possible with this optimized mixture. Vanderbeke in and of itself does not teach the steps disclosed in claim 1 of the present invention nor what is missing from Sirén 1 and Sirén 2.

For the foregoing reasons, it is submitted that the references alone or in combination do not teach what is claimed in the present invention.

The Examiner is respectfully requested to reconsider and withdraw the rejections of claims 1-20 under 35 USC 103(a), as being unpatentable over Sirén 1, in view of Sirén 2, further in view of Vanderbeke et al.

Summary

In view of the foregoing, Applicant respectfully submits that all pending claims are clearly and patentably distinguished over the references cited by the Examiner and, as such, are in condition for allowance.

Respectfully submitted,

Daphne L. Maravei
Patent Agent for Applicant
Reg. No. 53,881

Dated: December 21, 2009

BLAKE, CASSELS & GRAYDON LLP
20th Floor
45 O'Connor Street
Ottawa, Ontario
K1P 1A4

Tel: 613-788-2244
Fax: 613-788-2247